

Tech Prep Associate Degree: Preparing Today's Students for Tomorrow's Workplace

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For generations, America's brightest students have followed a College Prep course of study during their high school years. While this group of students has been guided through their high school experience, the majority of students have been left to their own devices to select the courses in which they will enroll. Being human beings and prone to human weaknesses, these students have usually chosen the path of least resistance and taken the least demanding courses possible. Few students take Algebra by choice! Often, the only goal for the majority of students has been to finish. Unfortunately, as our nation's high drop-out statistics indicate, finishing school has not always included receiving a diploma.

There is a certain irony in this scenario. Not trusting the intellect of our more advanced students to make the correct choices, we, as educators, have designed their curricula. Conversely, we have entrusted our average and below-average students with the decisions regarding the selection of their high school coursework, decisions that will affect their lives ever after. In so doing, we have failed to provide instruction in the concepts and skills needed to guarantee a decent future for the majority of our students.

Upon leaving high school, today's students enter a world of work which is vastly different from that which their parents faced. The technology revolution has radi-

cally changed all aspects of our lives, especially the workplace. Very few jobs for unskilled workers exist anymore, and those that do, offer wages at the bottom of the pay scale. Fast-food restaurants, often depended upon to provide the first jobs for many teens, may become so automated that these jobs will disappear. Recently, a friend stopped for a soft drink at a Hardee's Restaurant in Raleigh. Diane placed her order with the girl behind the counter, who pushed a few buttons on her cash register/computer. Diane then saw a cup drop onto a conveyer belt, where it was filled with ice and the soft drink of her choice. Next, a plastic cover was placed on the soft drink. No human was involved in the preparation of Diane's soft drink. How much longer will it be before Diane punches in her own order on the computer, inserts a plastic debit card for payment, and receives her whole meal without any assistance from a human being? And when this happens, what will our poorly educated young people (and some not-so-young people) be doing for employment?

The same type of automation is occurring in manufacturing plants, printing plants and health-care facilities, to name but a few. The technology revolution has permeated almost every aspect of life. If our youth are not prepared to function successfully in a world driven by technology, they will find themselves without the means to advance in their career fields. They may, in fact, find themselves without the skills necessary to find any employment. Jobs that require little or no thinking and, few, if any, physical skills needing special training are, like the dinosaurs, rapidly reaching the point of extinction in this country. The number of low-skilled jobs has been further reduced by the fact that many American manufacturers are building plants out of the country to take advantage of the lower wages in less technologically advanced nations.

Those who enter today's workforce need to have a

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firm academic and technological foundation. They need to be able to think and solve problems. Education is more important than it has ever been, and *more* education is more important than it has ever been. A high school diploma, even one earned by taking challenging coursework, is no longer sufficient to secure a good job. An Associate Degree from a two-year community/technical college is now a basic requirement for many employers.

The Richmond County Experiment

In 1986, Doug James, Superintendent of Richmond County Schools and Joe Grimsley, President of Richmond Community College, were searching for a better way to prepare the students of Richmond County for the workplace. President Grimsley was hearing complaints

which high school students would have a more rigorous course of study in both academics and vocational courses during their junior and senior years, and then move directly into a two-year Associate Degree program at a two-year community/technical college. *Tech Prep* was the name Parnell gave to this approach. Tech Prep, which stands for Technical Preparation, is a structured and challenging course of study designed to provide training for students who are interested in careers of a technical nature: accounting, nursing, medical technology, electronics, and drafting, for example. Through a blending of higher level academic and vocational/technical courses, Tech Prep prepares high school students for the advanced courses required by two-year technical and community colleges.

Grimsley and James agreed with the concepts offered by Parnell, but both believed that the junior year was too late to start such a program. By their junior year in high school, many students had already dropped out mentally, if not physically. They believed the intervention, to be effective, needed to be started earlier. They expanded the high school course of study by two years, so that the Richmond Tech Prep model is a "4 + 2" approach beginning in the 9th grade. In reality, because Tech Prep requires each student to be achieving on or above grade level in all courses, the concept permeates the entire educational experience, from entrance into kindergarten



Anatomy courses allow students to get a head start on health care professions.

from his faculty about the frequent need for remedial coursework for students entering college from Richmond Senior High School. Superintendent James was frustrated that the open-admissions policy of the college allowed anyone to enter, thereby reducing the motivation for students to take challenging courses in high school. Dropout rates at the high school were high (though consistent with the state averages), and many of the students who did receive their diplomas were poorly prepared for employment or going on to school. Both men knew the system was not working.

In their search for a solution, they came across Dale Parnell's book, *The Neglected Majority*. Parnell focused on the unchallenging and unstructured education being provided for the middle majority of students. He emphasized the need for producing a more technically advanced group of graduates in order to fulfill the needs of the job market. Parnell suggested a "2 + 2" model in

through the awarding of the Associate Degree. The progress of all children at all grade levels must be closely supervised and assessed to insure they are not falling behind. Those children who do not learn as quickly as their peers may need special help and more time to enable them to achieve at grade level.

Components of Success

In the years since the inception of Tech Prep, many changes have been made as the concept and the tangible products have been piloted and modified. The process has been, and continues to be evolutionary.

Currently, there are twelve components which have been identified as being critical to the success of Tech Prep. Those components are:

1. **Commitment of Key Leaders.** It is crucial that the superintendent of schools, the president of the commu-

nity college, and key community leaders are committed to the concept of Tech Prep. It is also essential that they make that commitment known to all persons associated with the institutions.

2. Collaboration of Key Leaders. In addition to being committed to Tech Prep, the key leaders in the area need to be willing to work collaboratively. This means giving up turf and working as a team for the benefit of all students. One of the primary reasons that Tech Prep has been so successful in Richmond County is the personal collaborative leadership of the Superintendent and President. They approach education issues from a "what is best for the students" perspective and leave egos and territorial issues outside the door. Ironically, putting aside individual egos has resulted in both systems receiving multiple awards and plaudits from the state and national levels for their work on Tech Prep.

3. Staff Orientation. All faculty and staff members need to understand the changes that are taking place in the world (the movement from an industrial society to a service/information society, the role of technology in the workplace, the impact of the global marketplace, etc.) and how Tech Prep is a viable educational solution to responding to those changes. They also need to know the basic philosophy and structure of Tech Prep, and that the leaders are committed to making Tech Prep a success.

4. Articulation Agreements. These are agreements between the community college(s) and the school district(s) that allow students to progress without duplication of efforts from secondary to post-secondary programs. Such agreements should also make provisions for students to earn college credit for college-level work mastered while in high school (Advanced Placement).

5. Curriculum Review. Assessments of courses and programs (both vocational and academic) need to be done on a regular basis, in order to determine the appropriateness and relevancy of content, to insure that there are no gaps in information, and to remove duplication of instruction. As a result of the review, it is likely that some courses will need to be eliminated and new ones added. Input from local employers is particularly beneficial in these endeavors, for they are most attuned to the skills and knowledge needed in the workplace.

6. Course of Study. Structured courses of study need to be developed in major career fields, such as Business and Health Occupations. Each course of study should include required and recommended academic and vocational courses. Coursework included should fulfill basic educational needs and the needs of the targeted career fields. Input from local employers is very helpful with this aspect of Tech Prep.

The Richmond County Tech Prep model has three career clusters: Business; Engineering (industrial, mechanical, and electrical); and Health and Human

Services. Students interested in nursing, for example, would be enrolled in the Health and Human Services cluster. In addition to their vocational courses related to nursing, they would also take a sequence of science coursework that would include chemistry, biology, and anatomy. All Tech Prep students are required to enroll in a sequence of math courses beginning with Algebra I and leading to Algebra II.

7. Relevancy of Instruction. Almost all students learn better if they understand a relationship between the information and skills being taught and the potential for their use in the real world. Teachers should design their teaching activities to help students understand why the information and/or skills are important.

Integrating vocational/technical and academic courses makes instruction more relevant. Academic courses should emphasize practical uses of information, while vocational courses should include lessons that require students to use their academic skills, such as reading, writing, and mathematics. There have been successful efforts by teams of teachers to integrate the vocational and academic coursework. For example, keyboarding teachers and English teachers have worked together to help their students produce reports that are grammatically correct, well written, and accurately and attractively presented. Such collaboration between teachers strengthens the concepts and skills to be learned and makes learning in both classes more relevant for the students. With good planning and a little luck, the age-old question from students (WHY do we have to learn this?) may be eliminated or at least diminished.

8. Staff Development. Many teachers need to upgrade their subject area skills and knowledge, particularly in the vocational/technical areas, where information and procedures are changing so rapidly. A partnership of local businesses and the school district in Cleveland County, North Carolina has resulted in selected vocational/technical teachers attending staff development workshops sponsored by local plants for their employees. The teachers have come away with a greater appreciation of concepts and skills needed to be taught and have begun to modify their course outlines and teaching styles accordingly.

As courses are updated or eliminated, teachers will need to adapt. At Richmond Senior High School, Tech Prep resulted in the offering of more sections of Algebra and fewer ones in General Math. That meant that some mathematics teachers needed a refresher course in Algebra, so they could make the transition.

Teachers also need to move from lectures to methods of instruction in which the students assume a more active role and the teacher spends more time in a facilitator role. Business and industry are asking for employees who can think on their feet, solve problems, and work as members of a team. If the schools are going to

deliver that type of person, the manner in which instruction takes place has to change.

9. Career Guidance. Helping students assess their abilities, aptitudes, and interests is essential to guiding them into the appropriate Tech Prep cluster. It is also important is providing them with information about the array of career options available in their areas of interest. A guidance program to provide these services needs to be in place.

10. Marketing. It is not enough to have a successful program or product. That program or product must be "sold" to the intended audience. Tech Prep means change, and change usually is accompanied by resistance. Successful marketing is crucial to overcoming resistance. In the case of Tech Prep, the audiences are internal (teachers, administrators, students, and parents) and external (employers and the community-at-large). Local employers in Richmond County have been extremely helpful in marketing. Prior to registration periods, many employers have placed brochures explaining and promoting Tech Prep in the paycheck envelopes of their employees.

11. Collecting Results. In order to assess the effects of Tech Prep, a system for collecting and analyzing data must be in place.

12. Reviewing and Revising. Tech Prep is not a static entity. It is, and should be, a constantly evolving and changing process. A system needs to be provided for regular review and interpretation of the data. From that information, the school leaders need to decide what, if any, changes are necessary to improve the program and

the results.

Tech Prep, however, is much more than a course of study or a set of components. It is primarily an *attitude*. That attitude, which is absolutely essential, says to the students, "You are capable, you can achieve, and you are *expected* to achieve." Administrators, teachers, and students need to believe that this is the case and allow that belief to govern their actions.

Tech Prep Achievements

Changing attitudes is definitely the greatest challenge for Tech Prep or for any activity in which human beings are involved. But for Tech Prep to succeed, it is essential that the administrators and teachers believe that every student can learn and achieve. That premise has become a reality in Richmond County, where students are demonstrating that their teachers' faith in their abilities is well founded.

Since the implementation of Tech Prep in Richmond County in 1986, the results have been most impressive. Early critics of the program warned that if the coursework was made more challenging, more students would drop out. Contrary to that belief, the opposite has occurred. The average annual high school dropout rate for grades 9-12 has decreased from 7.2 percent per grade (28.4 percent for the four grades) in 1985-86 to 2.95 percent per grade (11.8 percent for the four grades) in 1991-92. Of the 153 children who dropped out of school in 1990-91 in Richmond County, only 23 (15 percent) were Tech Prep students. The majority of dropouts (114-74.5 percent) were students who were not enrolled

in College or Tech Prep programs, but were in a General Education program.

Another finding was that more students were beginning to see college as a real possibility. Each spring, the State of North Carolina administers a survey to high school seniors about their post-secondary plans. In 1984, 48 percent of Richmond County seniors indicated that they intended to go on to a two-year or four-year college or university after graduation. By 1992, that number had risen to 81 percent. These statistics indicate



Tech Prep emphasizes the importance of computer skills, preparing students for community college coursework.

that students are beginning to understand and respond to the need for post-secondary education to prepare for the workplace. They also imply that students are changing their attitudes about their abilities to pursue a college degree and are seeing themselves as more capable persons.

Not only are more students indicating their intentions to attend college, but most are actually following through on those intentions. Surveys of 1989 and 1990 high school graduates showed that 67 percent of the 1989 graduates and 68 percent of the 1990 graduates were attending college. Additional information revealed that the 1989 and 1990 graduates of Tech Prep, who were enrolled at Richmond Community College, had a combined grade point average that was higher than that of the non-Tech Prep students.

One of the requirements of the Tech Prep course of study is enrollment in Algebra I, the first step toward completion of a sequence of math courses to include Geometry and Algebra I and II. In 1986, those who resisted Tech Prep warned that adding less capable students to Algebra would result in a lowering of the average scores on the North Carolina Algebra I end-of-course tests. Despite the increase in the number of Richmond High School students taking and completing Algebra I (from 47.1 percent in 1984 to 72.2 percent in 1992), the average scores did not fall. In fact, the core scores of Richmond High School students rose from 53.6 percent in 1986 to 62.2 percent in 1992. While still below the state average of 67.4 percent, the scores of Richmond County students are definitely higher than they were six years ago, and the gap is narrowing.

Because of the success of Tech Prep in Richmond County, in 1989, the North Carolina State Board of Education and the North Carolina State Board of Community Colleges passed a Joint Policy Statement supporting the expansion of Tech Prep into all public school districts and community college service areas in North Carolina. In support of this action, they provided funding to establish the North Carolina Tech Prep Leadership Development Center in Richmond County. The purpose of the Center is to help other North Carolina school districts and community colleges develop and refine Tech Prep in their own areas. Two basic methods of assistance have been made available:

(1) once-a-month, site visits in which guests travel to Richmond County and spend a day listening to presentations by Richmond's key players (president of community college, superintendent of schools, junior and senior high school principals, vocational director, college admissions director, etc.) and touring Richmond Senior High School to observe many of the classes; and

(2) technical assistance by the director of the Center, who travels to school districts upon receiving requests for assistance.

Recently, Richmond County was named as one of the seven national Tech Prep demonstration sites for the federal Department of Education. In this capacity, Richmond County Schools and Richmond Community College will be providing assistance in Tech Prep to school districts and community colleges all over the country. The means of assistance will be similar to that already being provided through the Center. In addition, the federal project will enable the Center staff to extend Tech Prep training to an even broader audience.

The Richmond County Tech Prep model has been the recipient of other awards. In the spring of 1992, the

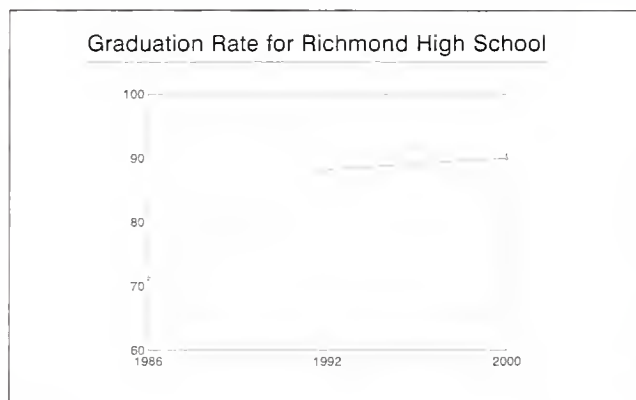


Figure 1.

Richmond Community College/Richmond County School District team was one of three teams from across the nation to receive the Parnell Tech Prep-Associate Degree Award presented by the American Association of Community and Junior Colleges (AACJC). In September 1992, the two institutions were again recognized for their accomplishments when they were presented the R.J. Reynolds' Tech Prep Founders Award.

It is important to look at Tech Prep in relation to other educational movements and directives currently underway in the nation. The most dominant is the America 2000 movement, initiated in 1991 by President Bush and the nation's 50 governors. America 2000 set forth six educational goals for the nation for the year 2000. Tech Prep directly responds to five of the six goals:

1. *The high school graduation rate will increase to at least 90 percent.* Tech Prep has resulted in the dropout rate for Richmond High School falling from 7.2 percent per class (28.8 percent for the four years) in 1986, to 2.95 percent (11.8 percent for the four years) in 1992. With this degree of progress, it is fully expected that Richmond County will achieve the 90 percent graduation goal by the year 2000. (See Figure 1)

2. *American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter, including English, mathematics, science, history, and geography; and every school in America will*

ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.

This goal is consistent with several sub-goals of Tech Prep, one of which is that students will be at or above grade level in *all* courses at all grade levels. Another objective of Tech Prep is that students are challenged to use their minds; learning does not focus on the memorization of information, but rather, on the utilization of information. The primary purpose of Tech Prep is to "prepare students for productive employment in our modern economy."

3. *U.S. students will be the first in the world in science and mathematics achievement.* Tech Prep students are required to take a sequence of math courses beginning with Algebra I and leading to Algebra II. They are also required to take a sequence of higher-level science courses that are related to their chosen career cluster. For example, a student in the Engineering cluster wishing to go into electronics would take physics or Principles of Technology. These courses are a long way from the general math and general science classes that they might have selected had they been General Education students. Very few of these unchallenging courses still exist at Richmond High School, for there are very few students who are not in a College Prep or Tech Prep program. By taking more challenging coursework in math and science, Richmond County students are doing their part toward bringing the nation back into a position of prominence in the areas of math and science.

4. *Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.* Communication skills are an important part of Tech Prep; each student is expected to be able to read, write, and communicate at grade level. The primary goal of Tech Prep is to prepare the students to compete in a global economy by insuring that they have the necessary knowledge and skills.

5. *Every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning.* Guests taking part in the on-site visitation to Richmond Senior High School are first struck by the orderliness and cleanliness of the school. Though the building is twenty years old, it looks as though it is new. The grounds are clean and well-kept. The next impression one gets is the feeling of productivity. Students and teachers move about with a purpose; there is no loitering. In the classrooms, it is often the students who proudly present the information about the courses. While hardly professional presenters, they do a fine job of explaining the information and responding to questions. The pride they have for their program is apparent. These youngsters have little time for drugs or violence. They are too busy working on challenging courses and

too proud of what they are doing to ruin their futures with drugs.

6. *All children in America will start school ready to learn* This goal focuses on preparing children for school, so it is not directly affected by Tech Prep. However, since Tech Prep students are expected to be on or above grade level as they progress through school, it is very important this goal be realized. Tech Prep may indirectly provide motivation for the achievement of this sixth goal.

The first wave of Tech Prep students to progress through four years at the secondary school level and two years at the college level have just recently graduated. There is a great deal of interest in what happens to these young people and how they will fare in the workplace. Common sense tells us they will succeed, but so far there is little data to support that assumption. The academic and technical skills they have acquired should serve them well. Still another factor needs to be considered: Tech Prep students have had high expectations placed upon them, and, having met those expectations, they are exiting their formal schooling with a sense of confidence and importance.

During one of the tours of Richmond Senior High School, a visiting principal from Nebraska, who was debating whether or not to implement Tech Prep in his school, asked a student what he thought was the best thing about Tech Prep. The student thought for a few seconds and then responded, "Tech Prep makes me feel as important as College Prep kids." The gentleman returned to Nebraska, where he immediately began work on implementing Tech Prep.cP

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